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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/919,850	08/02/2001	Hiroyuki Tomita	862.C2323	5660

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NEW YORK, NY 10112

EXAMINER

FRANK, ELLIOT L

ART UNIT	PAPER NUMBER
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2125

DATE MAILED: 02/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/919,850

Applicant(s)

TOMITA, HIROYUKI

Examiner

Elliot L Frank

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02 February 2004 has been entered.

Response to Amendment

2. The following first action after RCE is a response to applicant's pre-amendment (B) filed on 02 February 2004.
3. Applicant's explanations or corrections in regard to the problems cited in items 1-8 of the previous office action have been considered and are accepted.
4. Claims 18-28 remain pending from the previous office action. Claims 1-10 have been cancelled and claims 11-17 have been withdrawn due to a restriction requirement.
5. Claims 29-34 have been added by amendment and are now considered in this action.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 18,22,23 and 28-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Magome et al. (US 2002/0145711 A1).

The limitations of the aforementioned claims, and the applicable citations in Magome et al., are as follows:

18. (Currently Amended) An exposure apparatus comprising:

a projection optical system for projecting a pattern formed on a mask, onto an object to be exposed, which has a plurality of optical elements (page 1, paragraph 0002 and figure 4 which shows multiple optical elements), wherein said projection optical system has a first space enclosed with two optical elements of the plurality of optical elements and filled with a helium gas (page 2, paragraph 0018 and figure 4 item PL, which is shown in detail in figure 8), and

a second space enclosed with two optical elements of the plurality of optical elements and filled with a nitrogen gas (page 19, paragraph 0162 and figure 4 illustrate a system where pipe 88 provides N₂ to chambers CH1 which is bounded by lens 19 and distortion correcting flat plate L211),

wherein a pressure of the first space is higher than that of the second space
(While not expressly stated in Magome et al., it would have been obvious to one of

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ordinary skill in the art at the time the invention was made to have set the Helium space pressure higher than the Nitrogen space pressure given the teaching of preventing the gases in the adjacent environments from mixing (page 13, paragraph 0114) in view of the lower atomic weight and other related properties of Helium that were well known in the art per Magome et al. at page 1, paragraph 0007).

22. (Previously Presented) The apparatus according to claim 18, further comprising: a helium gas supply means for supplying the helium gas into the first space; a first exhaust means for exhausting an internal gas of the first space; a nitrogen gas supply means for supplying the nitrogen gas into the second space; and a second exhaust means for exhausting an internal gas of the second space (figure 4 of Magome et al. illustrates a system where pipes 31a,b provide He to chambers 6 and the PL of the apparatus while pipe 88 provides N₂ to chambers CH1 and CH2. The gas is exhausted through pipes 93-96).

23. (Previously Presented) The apparatus according to claim 18, further comprising a projection optical system for projecting exposure light from a pattern to an object to be exposed, wherein the first and second spaces are formed in the projection optical system (page 1, paragraph 0002).

Method claim 28 includes the same functional limitations as claim 18 with the additional requirement of developing the exposed object. Claim 18 has previously been shown to be obvious in view of Magome et al., and developing the object is read at page 1, paragraph 0002.

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29. (New) The apparatus according to claim 18, further comprising a support structure which support the plurality of optical elements, wherein said first and second spaces are disposed inside the support structure (Figure 7 demonstrates a support structure for optical elements which is shown in detail in figure 8).

Apparatus claim 30 and method claim 32 include the same functional limitations as claims 18 and 22 combined, and therefore are obvious in view of the same citations in Magome et al.

Apparatus claim 31 includes the same functional limitations as claim 29, and therefore is obvious in view of the same citations in Magome et al.

Apparatus claim 33 and device claim 34 include the same functional limitations as claims 18 with the additional requirement of the first and second spaces being adjacent to each other. Claim 18 has previously been shown to obvious in view of Magome et al., and chamber CH1 containing nitrogen is shown being adjacent to chamber PL containing helium in figure 4.

The limitations of claims 18,22,23 and 28-34 are obvious in view of Magome et al.

8. Claims 19-21 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over by Magome et al. (US 2002/0145711 A1) in view Tanaka et al. (US 2003/0020888 A1).

Claims 19-21 and 24-27 depend from claim 18. Claim 18 has been shown to be obvious in view of Magome et al.

While Magome et al. reads on the instant invention by providing an exposure apparatus with gas filled chambers of different refractive indexes, it does not specifically recite the additional limitations of claims 19-21 and 24-27 wherein the structures of the apparatus are described.

Tanaka et al., analogous to Magome et al. in that both are exposure apparatus systems (Tanaka, page 1, paragraph 0004), reads on the additional requirements of the aforementioned claims as follows

19. (New) The apparatus according to claim 18, wherein the first and second spaces are adjacent to each other (figure 1, items 310 and 311).

20. (New) The apparatus according to claim 19, wherein the first and second spaces are adjacent to each other via an optical element (page 5, paragraphs 0054-0056 and figure 1, optical item 301 separates items 310 and 311).

21. (New) The apparatus according to claim 18, wherein the pressure difference between the first and second spaces is not more than 1,000 Pa (It would have been obvious to have provided a pressure difference not more than 1,000 Pa due to the well known effect that the gas pressure has on the optical performance of the exposure device per page 1, paragraph 0012).

24. (New) The apparatus according to claim 18, wherein the first space is substantially closed except for an opening portion of the helium gas supply means and the first exhaust means (Pages 14-15, paragraph 0154 and figure 8).

25. (New) The apparatus according to claim 24, further comprising: a detection unit which detects the pressure of the first space; and an operation unit which

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operates the pressure of the first space based on the detection result of the detection unit (pages 5-6, paragraphs 0056-0057).

26. (New) The apparatus according to claim 18, wherein the second space is substantially closed except for an opening portion of the nitrogen gas supply means and the second exhaust means (Pages 14-15, paragraph 0154 and figure 8).

27. (New) The apparatus according to claim 26, further comprising: a detection unit which detects the pressure of the second space; and an operation unit which operates the pressure of the second space based on the detection result of the detection unit (pages 5-6, paragraphs 0056-0057).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included the features of Tanaka et al. into the Magome et al. system to have created an exposure apparatus that allows the pressure in an airtight chamber within the projection optical system to be adjusted after the atmosphere in the airtight chamber is replaced with a specific gas and a method of adjusting pressure in the projection optical system (Tanaka et al., page 2, paragraph 0019).

Response to Arguments

9. Applicant's arguments filed 02 February 2004 have been fully considered but they are not persuasive.

a. The applicant has argued that Magome et al. and Tanaka et al. both

i. Fail to disclose all of the structural elements of the claims as amended.

- ii. Teaches away from the method of the instant invention (Amendment (B), page 13, paragraph 3).
- b. The examiner respectfully disagrees and maintains the rejection from the previous office action.
- c. The examiner has amended his previous rejection to more clearly point out how the Magome et al. system reads on the structural limitations of the invention as amended. All of the structural elements required by the instant invention are contained within the Magome et al. system.
- d. The examiner has only relied on the teaching of Magome et al. as follows:
 - i. While not expressly stated in Magome et al., it would have been obvious to one of ordinary skill in the art at the time the invention was made to have set the Helium space pressure higher than the Nitrogen space pressure given the teaching of preventing the gases in the adjacent environments from mixing (page 13, paragraph 0114) in view of the lower atomic weight and other related properties of Helium that were well known in the art per Magome et al. at page 1, paragraph 0007).
 - ii. Given the broadest reasonable interpretation of both the instant invention and the Magome et al. system, The teaching relied upon in the prior art demonstrates keeping the pressure of a chamber containing one gas higher than the pressure of an adjacent chamber containing a different gas to prevent the gases in the second chamber

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from mixing into the first chamber causing contamination. This is the identical motivation used in the instant invention for keeping the Helium chamber at a higher pressure from the Nitrogen chamber (specification page 5).

- iii. Given the similar nature of the teachings of both the instant invention and the reference, the argument that the Magome et al. reference teaches away from the instant invention is deemed not persuasive.
- e. Therefore, the rejections in view of Magome et al. and Tanaka et al. have been deemed to be valid and have been maintained.

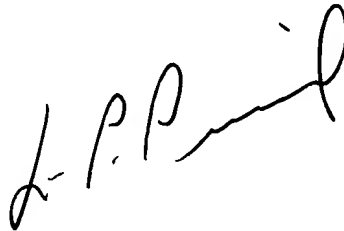
Conclusion

- 10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elliot L Frank whose telephone number is (703) 305-5442. The examiner can normally be reached on M-F 7-4:30, 1st Friday off.
- 11. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo P Picard can be reached on (703) 308-0538. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ELF
February 12, 2004

A handwritten signature in black ink, appearing to read 'L. Picard', with a stylized flourish at the end.

LEO PICARD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100